

To: GHG-Endangerment-Docket@epa.gov
Re: Docket ID No. EPA-HQ- OAR-2009-0171

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Please find the following comments related to EPA's April 24, 2009 **Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act**.

My comments also address issues in the April 17, 2009 **Technical Support Document (TSD)** that includes many of the detailed references to science, data, and models used to justify material in the **Endangerment Finding (EF)**.

1. Summary of Principal Comment

This Comment concentrates on TSD Section 5 "*Attribution of Observed Climate Change to Anthropogenic Greenhouse Gas Emissions at the Global and Continental Scale.*" Since it follows the line of argument of the U.N. IPCC (IPCC) and the U.S. Climate Change Science Program (CCSP), I will actually critique the IPCC report itself as well as the CCSP

I contrast the title of TSD Section 5 with the NIPCC 2008 Report "*Nature, Not Human Activity, Controls the Climate,*" which responds to the claims of the UN-IPCC. I submit a copy of this Summary document for the record (link: http://www.sepp.org/publications/NIPCC_final.pdf). I also submit the full NIPCC report, which can be accessed at www.nipccreport.org

Key issue: Is the cause of global warming natural (and therefore unstoppable) or are anthropogenic greenhouse (GH) gases responsible for 20th century climate changes? We know of no evidence that supports anthropogenic global warming (AGW), the main conclusion of IPCC (and EPA). **EPA's EF-TSD presents no independent evidence to support the claim that CO2 is a pollutant.** This is our principal disagreement with the EPA Endangerment Finding.

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Since the greenhouse gas, carbon dioxide, is globally distributed, we need to determine whether the observed rise in CO2 can produce the kind of temperature increase demonstrated by greenhouse models. The key parameter is the so called "**climate sensitivity (CS)**," usually defined as the increase of global mean surface temperature produced by a doubling of global CO2 concentration.

Published models give differing values of CS, usually ranging between 1.5 and 4.5 degC. It has become evident that these differences come about from different ways in which model parameters are chosen. Depending on assumed parameter values, the climate sensitivity can even be lower than 1.5 and can range up to 11.5 degC. These models are the basis of the "evidence" EPA purports to reveal in the TSD.

The question then arises about the validity of such model results, which can only be established through a comparison with observations. But observed temperature trends of the past 100 years are sometimes positive (1920-1940) and sometimes negative (1940-1975, and also since 1998), in spite of increasing CO2 trends. Clearly, one cannot reproduce observed temperatures simply by using greenhouse (GH) forcing. As a result, the IPCC (and EPA) have attempted to reproduce the observed temperature history of the 20th century by using a combination of GH gas forcing, aerosol and ozone forcing, and natural forcing (which includes volcanoes and Total Solar Irradiance -- TSI). **There are at least four problems with this procedure, which makes it unsuitable for validating climate models and then using these model results to justify "endangerment":**

1. Agreement between the observed temperature history and IPCC model results can only be achieved by choosing the right adjustable parameters for these major anthropogenic and natural forcings. This choice is arbitrary and

clearly becomes an exercise in “curve fitting” and nothing more. While a suitable choice of parameters may fit the global temperature data, the same choice does not fit the northern hemisphere and southern hemisphere separately.

2. The IPCC procedure concentrates on GH gases but ignores other possible important human influences, such as the “urban heat island” effect and changes in surface albedo -- from agriculture, from deforestation and reforestation, from major biomass burning, and from major pollution, like the Asian “brown cloud.”

3. An even more serious problem is the inadequate way in which models handle water vapor, the most important GH gas, and especially the properties and distribution of clouds. Most differences in CS between models arise from these microphysics factors and choice of cloud parameters. This can be seen from the poor way in which IPCC models handle precipitation. **Even more important, while all models incorporate a positive feedback from water vapor (WV), observational results suggest that the feedback is actually negative and reduces the warming effects of CO₂.**

4. Finally, the IPCC and the CCSP have ignored what is perhaps the major natural forcing, resulting from changes in solar activity. Investigations of paleo-temperatures, for example in stalagmites, have established without doubt a detailed correlation between temperature and cosmic-ray intensity (which in turn is modulated by changes in solar activity). Under the category of “solar forcing” the IPCC (and EPA) consider only changes in TSI, which are too small to be important.

CONCLUSION:

To meet its obligations under the Information Quality Act, EPA must carefully review every document that it purports to use for its policy determinations, especially documents and model projections that were produced outside of the requirements of U.S. law.

Also: Under the U.S. Supreme Court’s 2007 ruling in Massachusetts v. EPA, the agency can regulate air pollutants only if its endangerment finding is reasoned and not subject to “**profound scientific uncertainty**.”

The evidence from the “fingerprint” analysis of NIPCC [see Appendix--E] clearly shows that the increase in CO₂ has not produced a detectable increase in global temperature in the past 30 years. Hence:

- **Climate Sensitivity is about one-tenth of the median value of IPCC (and EPA-TSD).**
- **CO₂ is not a pollutant.**
- **The Administrator should not use the IPCC report as a foundation document for the proposed Endangerment Finding but must conduct an open and transparent independent analysis.**

2. Additional Comments Based on the NIPCC 2008 Findings Related to the TSD Issues

- **Evidence of warming is not evidence that the cause is anthropogenic.**
- The so-called ‘hockey-stick’ diagram of warming has been discredited.
- The correlation between temperature and carbon dioxide levels is inconsistent.
- **Computer model results don’t constitute “evidence” for anthropogenic global warming.**
- The global surface temperature record itself is unreliable.
- Global warming prior to 1940 was not anthropogenic. Climate cooled from 1940 to 1976.
- Internal oscillations play a major role in climate change, yet cannot be forecast.
- The role of solar influences on the climate can no longer be neglected.
- **Computer models:**

- do not consider solar dimming and brightening.
- cannot accurately model the role of clouds.
- do not simulate a possible negative feedback from water vapor.
- do not explain many features of the Earth's observed climate.
- cannot produce reliable predictions of regional climate change.
- **Estimates of recent sea-level rise are unreliable.**
- 'Bottoms-up' modeling of future sea levels does not uniformly predict rising sea levels.
- Each successive IPCC report has forecast a smaller sea-level rise.
- Forecasts of more rapid sea-level rise are not credible.
- Past trends in atmospheric levels of CO2 are poorly understood and controversial.
- Carbon dioxide sources and sinks are poorly understood.
- The role of oceans as CO2 sources and sinks is a major source of uncertainty.
- **The IPCC's estimates of future anthropogenic CO2 emissions are too high.**
- Higher concentrations of CO2 would be beneficial to plant and animal life.
- Higher concentrations of CO2 are not responsible for weather extremes, storms, or hurricanes.
- Human health and national economies generally benefit from warmer temperatures.

Further: It is well understood that EPA cannot single out CO2 but must control emissions of all GH gases. These, of course, include **methane** and **nitrous oxide**, more potent GH gases than CO2. Major natural sources of CH4 are wetlands; major anthropogenic sources include landfills, rice growing, and methane from ruminants (mainly cattle and sheep) whose population increases roughly at the same rate as population [Singer 1971]. The major human-related source of N2O is soil management, related to fertilizer use and other agricultural practices.

3. Appendices:

A--Erroneous claims and statements in the EF/TSD

B--What is the NIPCC?

C--The "Fingerprint Method"

D--Additional Observations on the Problems with IPCC process

E--Results of Fingerprint Analysis: Nature Rules the Climate, not Human Activity

F--References

APPENDICES

APP- A--Erroneous claims and statements in the EF/TSD

I list here (in italics) specific claims and statements in the EF/TSD, all contradicted by the NIPCC

Observed Trends in Greenhouse Gas Emissions and Concentrations

[OE 4] Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations. Climate model simulations suggest natural forcing alone (e.g., changes in solar irradiance) cannot explain the observed warming.

[OE 5] U.S. temperatures also warmed during the 20th and into the 21st century; temperatures are now approximately 0.7°C (1.3°F) warmer than at the start of the 20th century, with an increased rate of warming over the past 30 years. Both the IPCC and CCSP reports attributed recent North American warming to elevated GHG concentrations. In the CCSP (2008g) report the authors find that for North America, “more than half of this warming [for the period 1951-2006] is likely the result of human-caused greenhouse gas forcing of climate change.”

Projections of Future Climate Change with Continued Increases in Elevated GHG Concentrations

[PF 2] Future warming over the course of the 21st century, even under scenarios of low emissions growth, is very likely to be greater than observed warming over the past century. According to climate model simulations summarized by the IPCC, through about 2030, the global warming rate is affected little by the choice of different future emission scenarios. By the end of the century, projected average global warming (compared to average temperature around 1990) varies significantly depending on emissions scenario and climate sensitivity assumptions, ranging from 1.8 to 4.0°C (3.2 to 7.2°F), with an uncertainty range of 1.1 to 6.4°C (2.0 to 11.5°F).

TSD.39

5(a) Attribution of observed climate change to anthropogenic emissions

Computer-based climate models are the primary tools used for simulating the likely patterns of response of the climate system to different forcing mechanisms (both natural and anthropogenic). Confidence in these models comes from their foundation in accepted physical principles and from their ability to reproduce observed features of current climate and past climate changes (IPCC, 2007a).

Studies to detect climate change and attribute its causes using patterns of observed temperature change show clear evidence of human influences on the climate system (Karl et al., 2006).

The Third Assessment Report in 2001 concluded that most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations (IPCC, 2001b). The conclusion in IPCC's 2007 Fourth Assessment Report (2007b) is the strongest yet:

Most of the observed increase in global average temperatures since the mid-20th century is very likely²⁰ due to the observed increase in anthropogenic greenhouse gas concentrations.

TSD.40

The increased confidence in the greenhouse gas contribution to the observed warming results from (Hegerl. et al., 2007):

- an expanded and improved range of observations allowing attribution of warming to be more fully addressed jointly with other changes in the climate system*

TSD.41

Fingerprint studies have identified greenhouse gas and sulfate aerosol signals in observed surface temperature records, a stratospheric ozone depletion signal in stratospheric temperatures, and the combined effects of these forcing agents in the vertical structure of atmospheric temperature changes (Karl et al., 2006). However, an important inconsistency may have been identified in the tropics. In the tropics, most observational data sets show more warming at the surface than in the troposphere, while almost all model simulations have larger warming aloft than at the surface. A possible explanation for this inconsistency is error in the observations, but the issue is still under investigation (Karl et al., 2006).

Fingerprint studies use rigorous statistical methods to compare the patterns of observed temperature changes with model expectations and determine whether or not similarities could have occurred by chance. Linear trend comparisons are less powerful than fingerprint analyses for studying cause-effect relationships, but can highlight important differences and similarities between models and observations (as in Figures 5.1 and 5.2).

NOTE: NIPCC agrees with footnote 21 above. Also note that TSD.41 admits that fingerprints don't match in the crucial region of the tropics (30 S to 30N)

APP-B--What is the NIPCC (Nongovernmental International Panel on Climate Change)?

NIPCC is what its name suggests: an international panel of 30+ *nongovernmental* scientists and scholars from 15 countries who have come together to understand the causes and consequences of climate change. **The credentials of the NIPCC Contributors exceed the “expert reviewers” of the EPA’s TSD.** Because we are not predisposed to believe climate change is caused by human greenhouse-gas emissions, we are able to look at evidence the IPCC ignored. Because we do not work for governments, we are not biased toward the assumption that greater government regulation is necessary to avert imagined catastrophes. Nor are we dependent on government funding for our livelihood.

What was our motivation? It wasn't financial self-interest: No grants or contributions were provided or promised in return for producing the report. It wasn't political: No government agency commissioned or authorized our efforts, and we do not advise or support the candidacies of any politicians or candidates for public office.

We have produced a 40-page Summary [2008] and a full 880-page Report [2009]. They can be downloaded at:

NIPCC summary report “Nature – Not Human Activity – Rules the Climate”

http://www.sepp.org/publications/NIPCC_final.pdf

The full NIPCC report: Craig Idso and S. Fred Singer, *Climate Change Reconsidered: The 2009 Report of the Nongovernmental International Panel on Climate Change*, Chicago, IL: The Heartland Institute, 2009.

www.nipccreport.org

APP-C--The “Fingerprint Method”

Validating climate models, requires the so-called “fingerprint method,” which compares the patterns of temperature change calculated from GH models with observed patterns. Such a comparison is carried out in CCSP Report SAP-1.1 [CCSP Karl 2006] and has been further elaborated in a research paper by Douglass et al. [International Journal of Climatology, Royal Meteorological Society, Dec. 2007].

The crucial question is: Is warming due to natural or human causes? How can one tell? The issue is of obvious importance since natural causes cannot be influenced in any way by policies that limit greenhouse (GH) gas emissions, such as CO₂. Resolving the question is a difficult scientific task. Natural causes are plausible; the climate has been warming and cooling for billions of years on many different time scales [See, e.g., Singer and Avery 2007]. On the other hand, GH warming is also plausible, since the concentration of GH gases has been increasing due to human activities.

The results of the fingerprint analysis show no detectable human GH contribution to warming in the past 30 years, in

spite of rapid rise of GH gas levels in the atmosphere

The IPCC's Long History of Manipulation

The method agreed to by everyone is the “fingerprint” method, which compares the pattern of temperature trends calculated from GH models with the pattern observed in the atmosphere. The first application of this method may have been by Santer et al in IPCC-SAR [1996]. However, Santer misapplied the method in order to force the conclusion that warming was due to human causes, namely GH gases.

In one attempt, he compared the geographic pattern of surface temperature trends, derived from GH models, with the observed pattern. He calculated a “pattern correlation coefficient” and claimed that it was increasing with time “as the human signal emerged from the background noise of climate variability” [IPCC-SAR, 1996, chapter 8]. However, when the graph there is compared to the one in his original publication [Santer et al 1995], **one discovered that he had removed all of the trend lines, including zero and negative trends, except the one that suggested an increasing correlation in the last 50 years [Singer 1997].** When questioned about this by e-mail, he replied that it was done for “pedagogic reasons”. Santer also made significant text changes in Chapter 8 of the IPCC-SAR report, after its approval by coauthors. See discussion by SF Singer et al [Bull. AMS 78:81-82, 1997], and E. Masood [Nature 381:039, 1996]

Santer's second attempt, also in WG1 Chapter 8 of IPCC-SAR, was to compare the modeled and observed latitude and altitude patterns of temperature trends. **It was soon discovered, however, that his claimed “agreement” was due to a selective use of data; he had chosen a time interval (1963-1987) during which the tropospheric trend was increasing, while the overall trend during the period (1957-1995) was not** [Michaels and Knappenberger 1996].

By then it had become quite apparent that there was a disparity between the observed trends in the troposphere and the surface [NRC 2000; Singer 2001]:

Douglass, Pearson and Singer carried out a full-scale comparison of available model results and temperature observations from balloons, satellites, and reanalysis [2004]. **They concluded that the observations did not confirm the expected increase (from GH models) in temperature trends with altitude in the tropics; but they did not delve into the implication of this disparity.** As a result, their result was largely ignored by the IPCC as it prepared its Third Assessment Report.

The US CCSP

Next, a full-scale investigation of this problem was carried out as part of the federally financed Climate Change Science Program. CCSP-SAP1.1 [Karl, et al 2006], the first and most crucial of the 21 reports of the CCSP, titled “Temperature Trends in the Lower Atmosphere: Steps for Understanding and Reconciling Differences,” confirmed the result of Douglass et al [2004].

To be sure, the abstract of CCSP 1.1 claims that the discrepancies between surface warming and tropospheric warming trends have been removed. This statement distorts the sense of the CCSP report and has been widely misunderstood as having confirmed the validity of GH models. CCSP-SAP 1.1 admits, however, that in the tropics *“the majority of observational data sets show more warming at the surface than in the troposphere....[but] almost all model simulations show more warming in the troposphere than at the surface”* In other words, there exists indeed a discrepancy, which has not been removed. This Executive Summary was authored by Wigley, with the participation of the chapter lead authors, including Santer.

Contrary to the claim on page 37, line 31 [CCSP Karl 2006], the comparison of modeled and observed fingerprints shows clear disagreement [see figures 1.3F and 5.7E, and also 5.4G from CCSP-1.1]. While the Executive Summary of this report claims agreement, this is achieved by a statistical device, i.e. by using the “range” of values instead of their “distribution” (see figure 4G, page 13 in CCSP 1.1). However, the use of range is clearly inappropriate [Douglass et al. 2007] since it gives undue weight to “outliers.”

Following the publication of CCSP 1.1, and using best available models and data, Douglass, Christy, Pearson, and Singer [2007] extended their comparison between model results and observations in the tropical zone and concluded again that the observations did not confirm the GH model results. This paper was also ignored until a group of independent scientists, the Nongovernmental International Panel on Climate Change (NIPCC) published its summary report in 2008. Drawing mainly on the data from CCSP-1.1 and Douglass et al [2007], NIPCC 2008 [Singer et al] showed conclusively the disparity between GH models and observations.

The NIPCC then drew the obvious logical conclusion: Since GH models cannot explain the observations, the warming of the past 30 years must be due predominantly to causes other than GH gases. In other words, the human contribution to the warming trend since 1979 is minor and insignificant – a conclusion contrary to that of IPCC [2007]. Another way of stating the NIPCC result: Climate Sensitivity is considerably less than the values quoted by the IPCC, i.e. 1.5 – 4.5 degC, and more in accord with the much lower values deduced by other methods.

Recent Data Re-confirms Model Error

Recent data [Douglass and Christy 2008] confirms that the CO2 forcing signature assumed by ALL models does not exist. The data shows that global atmospheric temperature anomalies of *Earth* reached a maximum in 1998 that has not been exceeded during the subsequent 10 years. The global anomalies are calculated from the average of climate effects occurring in the tropical and the extratropical latitude bands. *El Niño/La Niña* effects in the tropical band are shown to explain the 1998 maximum while variations in the background of the global anomalies largely come from climate effects in the northern extra-tropics **but not in the southern extra-tropics**. These effects do not have the signature associated with CO2 climate forcing with positive feedback assumed by every climate model used in both the IPCC AR4 and the CCSP.

We conclude, therefore -- contrary to the assertions of the EPA Endangerment Technical Support Document -- that climate sensitivity must be well below the values quoted by climate models, and that any estimates of future warming based on such models are neither reliable nor usable by any US government agency for policy purposes. This caveat applies to the MAGICC model developed by Tom Wigley for the EPA because it relies on Climate Sensitivities extracted from the IPCC. EPA should not use this model for any U.S. policy or regulatory analysis.

Another way of putting our result: The evidence clearly shows that the increase in CO2 has not produced a detectable increase in global temperature.

We believe that this is the strongest argument against the EPA's attempt to treat carbon dioxide as a pollutant under the Clean Air Act.

APP-D--Additional Observations on the Problems with IPCC process

The IPCC can't be trusted as a credible science document and does not meet the requirements of the Federal Information Quality Act

From the very beginning, the IPCC was a political rather than scientific entity, with its leading scientists reflecting the positions of their governments or seeking to induce their governments to adopt the IPCC position. **In particular, a small group of activists wrote the all-important Summary for Policymakers (SPM) for each of the four IPCC reports [McKittrick et al. 2007].**

While we are often told about the thousands of scientists on whose work the Assessment reports are based, the vast majority of these scientists have no direct influence on the conclusions expressed by the IPCC. Those are produced by an inner core of scientists, and the SPMs are revised and agreed to, line-by-line, by representatives of member governments. This obviously is not how real scientific research is reviewed and published. **These SPMs turn out, in all cases, to be highly selective summaries of the voluminous science reports – typically 800 or more pages, with no indexes (except, finally, the Fourth Assessment Report released in 2007), and essentially unreadable except by dedicated scientists.**

The IPCC's 1990 First Assessment Report [FAR] concluded that the observed temperature changes were “broadly

consistent” with greenhouse models. Without much analysis, it arrived at a “climate sensitivity” of a 1.5° to 4.5° C temperature rise for a doubling of greenhouse gases. The IPCC FAR led to the adoption of the Global Climate Treaty at the 1992 Earth Summit in Rio de Janeiro. The FAR drew a critical response [SEPP 1992]. FAR and the IPCC’s style of work also were criticized in two editorials in *Nature* [Anonymous 1994, Maddox 1991]. The IPCC’s 1996 Second Assessment Report [IPCC SAR] was completed in 1995 and published in 1996. Its SPM contained the memorable conclusion, “the balance of evidence suggests a discernible human influence on global climate.” **The SAR was again heavily criticized, this time for having undergone significant changes in the body of the report to make it ‘conform’ to the SPM – after it was finally approved by the scientists involved in writing the report. Not only was the report altered, but a key graph was also doctored to suggest a human influence. The evidence presented to support the SPM conclusion turned out to be completely spurious.**

There is voluminous material available about these text changes, including a *Wall Street Journal* Opinion Editorial article by Dr. Frederick Seitz [Seitz 1996]. See the excerpt below:

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A Major Deception on Global Warming

Op-Ed by Frederick Seitz, *Wall Street Journal*, June 12, 1996

“Last week the Intergovernmental Panel on Climate Change, a United Nations organization regarded by many as the best source of scientific information about the human impact on the earth’s climate, released “The Science of Climate Change 1995,” its first new report in five years.

...But this report is not what it appears to be--it is not the version that was approved by the contributing scientists listed on the title page. In my more than 60 years as a member of the American scientific community, including service as president of both the National Academy of Sciences and the American Physical Society, I have never witnessed a more disturbing corruption of the peer-review process than the events that led to this IPCC report.

A comparison between the report approved by the contributing scientists and the published version reveals that key changes were made after the scientists had met and accepted what they thought was the final peer-reviewed version. The scientists were assuming that the IPCC would obey the IPCC Rules--a body of regulations that is supposed to govern the panel’s actions. Nothing in the IPCC Rules permits anyone to change a scientific report after it has been accepted by the panel of scientific contributors and the full IPCC.

The participating scientists accepted “The Science of Climate Change” in Madrid last November [1995]; the full IPCC accepted it the following month in Rome. But more than 15 sections in Chapter 8 of the report--the key chapter setting out the scientific evidence for and against a human influence over climate--were changed or deleted after the scientists charged with examining this question had accepted the supposedly final text.

Few of these changes were merely cosmetic; nearly all worked to remove hints of the skepticism with which many scientists regard claims that human activities are having a major impact on climate in general and on global warming in particular.

The following passages are examples of those included in the approved report but deleted from the supposedly peer-reviewed published version:

“None of the studies cited above has shown clear evidence that we can attribute the observed [climate] changes to the specific cause of increases in greenhouse gases.” □

“No study to date has positively attributed all or part [of the climate change observed to date] to anthropogenic [man-made] causes.” □

“Any claims of positive detection of significant climate change are likely to remain controversial until uncertainties in the total natural variability of the climate system are reduced.”

The reviewing scientists used this original language to keep themselves and the IPCC honest. *I am in no position to know who made the major changes in Chapter 8; but the report’s lead author, Benjamin D. Santer, must presumably take the major responsibility.* (emphases added)

Mr. Seitz is president emeritus of Rockefeller University and chairman of the George C. Marshall Institute.

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This led to heated discussions between supporters of the IPCC and those who were aware of the altered text and graph, including an exchange of letters in the *Bulletin of the American Meteorological Society* [Singer et al. 1997].

SAR also provoked the 1996 publication of the Leipzig Declaration by SEPP, which was signed by some 100 climate scientists. A booklet titled “The Scientific Case Against the Global Climate Treaty” followed in September 1997 and was translated into several languages. [SEPP 1997. All these are available online at www.sepp.org.] In spite of its obvious shortcomings, the IPCC report provided the underpinning for the Kyoto Protocol, which was adopted in December 1997.

The background is described in detail in the booklet “Climate Policy – From Rio to Kyoto,” published by the Hoover Institution [Singer 2000]. The Kyoto Protocol also provoked the adoption of a short statement expressing doubt about its scientific foundation by the Oregon Institute for Science and Medicine, which attracted more than 19,000 signatures from scientists, mainly in the U.S. [The statement is still attracting signatures, and can be viewed at www.oism.org.]

The Third Assessment Report (TAR) of the IPCC in 2001 [IPCC 2001] was noteworthy for its use of spurious scientific papers to back up its SPM claim of “new and stronger evidence” of anthropogenic global warming. One of these was the so called ‘hockey-stick’ paper, an analysis of proxy data, which claimed the twentieth century, was the warmest in the past 1,000 years. The paper was later found to contain basic errors in its statistical analysis. This paper and its author was the subject of Congressional testimony (House Energy and Commerce Committee) on July 19, 2006:

Excerpt of Dr. Edward Wegman testimony

“It is not clear that Mann and associates realized the error in their methodology at the time of publication. Our re-creation supports the critique of the [Mann]MBH98 methods.

“In general, we found the writing in MBH98 and MBH99 to be somewhat obscure and incomplete and the criticisms by MM03/05a/05b to be valid. The reasons for setting 1902-1995 as the calibration period presented in the narrative of MBH98 sounds plausible, and the error may be easily overlooked by someone not trained in statistical methodology. We note that there is no evidence that Dr. Mann or any of the other authors in paleoclimate studies have had significant interactions with mainstream statisticians.

“ Because of this apparent isolation, we decided to attempt to understand the paleoclimate community by exploring the social network of authorships in temperature reconstruction.

“We found that at least 43 authors have direct ties to Dr. Mann by virtue of coauthored papers with him. Our findings from this analysis suggest that authors in the area of this relatively narrow field of paleoclimate studies are closely connected. Dr. Mann has an unusually large reach in terms of influence and in particular Drs. Jones, Bradley, Hughes, Briffa, Rutherford and Osborn.

*“Because of these close connections, independent studies may not be as independent as they might appear on the surface. Although we have no direct data on the functioning of peer review within the paleoclimate community, but with 35 years of experience with peer review in both journals as well as evaluation of research proposals, **peer review may not have been as independent as would generally be desirable.** (Emphasis Added)*

The IPCC also supported a paper that claimed pre-1940 warming was of human origin and caused by greenhouse gases. This work, too, contained fundamental errors in its statistical analysis. The SEPP response to TAR was a 2002 booklet, “The Kyoto Protocol is Not Backed by Science” [SEPP 2002].

The Fourth Assessment Report (AR4) of the IPCC was published in 2007 [IPCC 2007]; the SPM of Working Group I was released in February 2007 [IPCC SPM 2007]; **and the full report from this Working Group was released in May – after it had been changed, once again, to ‘conform’ to the Summary.** It is significant that AR4 no longer makes use of the hockey-stick paper or the paper claiming pre-1940 human-caused warming. AR4 concluded that “most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations” (emphasis in the original). However, as the present report will show, it ignored available evidence *against* a human contribution to current warming and the substantial research of the past few years on the effects of solar activity on climate change.

Why have the IPCC reports been marred by controversy and so frequently contradicted by subsequent research?

Certainly its agenda to find evidence of a human role in climate change is a major reason; its organization as a government entity beholden to political agendas is another major reason; and the large professional and financial rewards that go to scientists and bureaucrats who are willing to bend scientific facts to match those agendas is yet a third major reason. Another reason for the IPCC's unreliability is the naive acceptance by policymakers of 'peer reviewed' literature as necessarily authoritative. It has become the case that refereeing standards for many climate-change papers are inadequate, often because of the use of an 'invisible college' of reviewers of like inclination to a paper's authors. [Wegman et al. 2006] (For example, some leading IPCC promoters surround themselves with as many as two dozen coauthors when publishing research papers.) Policy should be set upon a background of demonstrable science, not upon simple (and often mistaken) assertions that, because a paper was refereed, its conclusions must be accepted.

APP-E--Results of Fingerprint Analysis: Nature Rules the Climate, not Human Activity

The IPCC (IPCC-SAR, 1996, p. 411; IPCC, 2007-I, p. 668) and most scientists believe the "fingerprint" method is the only reliable one. It compares the observed pattern of warming with a pattern calculated from greenhouse models. While an agreement of such fingerprints cannot prove an anthropogenic origin for warming, it would be consistent with such a conclusion. The observed mismatch, however, argues strongly against any significant contribution from GH gas forcing and supports the conclusion that the observed warming is mostly of natural origin.

Climate models all predict that, if a GH effect is driving climate change, there will be a unique fingerprint in the form of a warming trend increasing with altitude in the tropical troposphere, the region of the atmosphere up to about 15 kilometers. (See Fig. 1 below) Climate changes due to solar variability or other known climate forcings will not yield this pattern; only sustained greenhouse warming will do so.

The fingerprint method was first attempted in the IPCC's Second Assessment Report (SAR) (IPCC-SAR, 1996, p. 411). Its Chapter 8, titled "Detection and Attribution," attributed observed temperature changes to anthropogenic factors—greenhouse gases and aerosols. The attempted match of warming trends with altitude turned out to be spurious, since it depended entirely on a particular choice of time interval for the comparison (Michaels and Knappenberger, 1996). Similarly, an attempt to correlate the observed and calculated geographic distribution of surface temperature trends (Santer *et al.* 1996) involved making changes on a published graph that could and did mislead readers (Singer, 1999, p. 9; Singer, 2000, pp. 15, 43-44). In spite of these shortcomings, IPCC-SAR concluded that "the balance of evidence" supported AGW.

With the availability of higher-quality temperature data, especially from balloons and satellites, and with improved GH models, it has become possible to apply the fingerprint method in a more realistic way. This was done in report SAP-1.1, issued by the US Climate Change Science Program (CCSP) in April 2006, making it readily available to the IPCC for its Fourth Assessment Report [2007]. It permits the most realistic comparison of fingerprints (Karl *et al.*, 2006).

While all climate models show an increasing warming trend with altitude, peaking around 10 km at roughly two times the surface value, the temperature data from balloons give the opposite result: no increasing warming, but rather a slight cooling with altitude in the tropical zone. See Figures 2 and 3, taken directly from the CCSP report.

Both the IPCC and the CCSP agree that the pronounced increase in warming trend with altitude is the "fingerprint" of greenhouse forcing. The mismatch of observed (balloons and satellites) and model-calculated fingerprints clearly falsifies the hypothesis of anthropogenic global warming (AGW).

EPA must conclude therefore that anthropogenic greenhouse gases can contribute only in a minor way to the current warming, which is mainly of natural origin.

PCM Simulations of Zonal-Mean Atmospheric Temperature Change Total linear change computed over January 1958 to December 1999

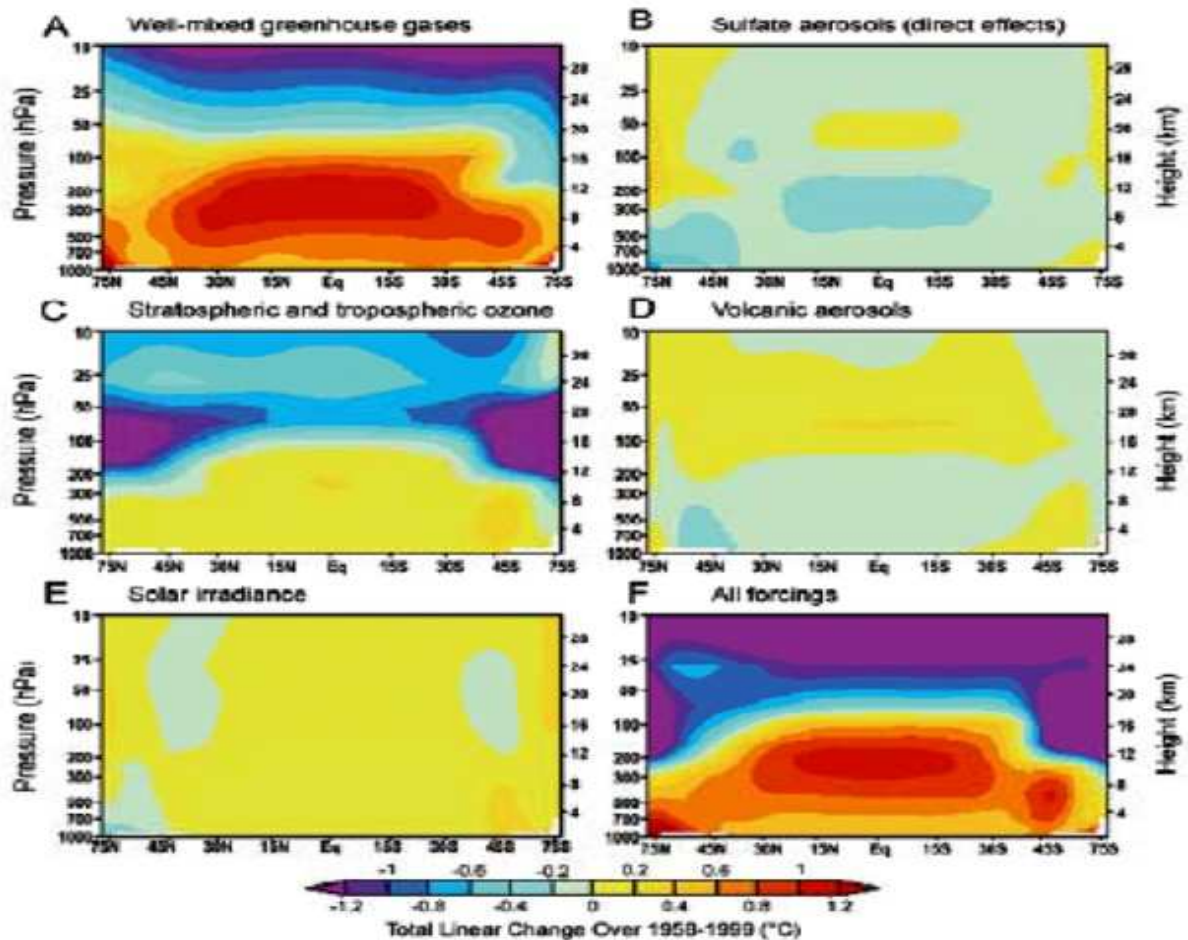


Figure 1.3. PCM simulations of the vertical profile of temperature change due to various forcings, and the effect due to all forcings taken together (after Santer et al., 2000).

Figure 1. Model-calculated zonal mean atmospheric temperature change from 1890 to 1999 (degrees C per century) as simulated by climate models from [A] well-mixed greenhouse gases, [B] sulfate aerosols (direct effects only), [C] stratospheric and tropospheric ozone, [D] volcanic aerosols, [E] solar irradiance, and [F] all forcings (U.S. Climate Change Science Program 2006, p. 22). Note the pronounced increase in warming trend with altitude in figures A and F, which the IPCC identified as the 'fingerprint' of greenhouse forcing.

The CCSP report is an outgrowth of an NAS report “Reconciling Observations of Global Temperature Change”

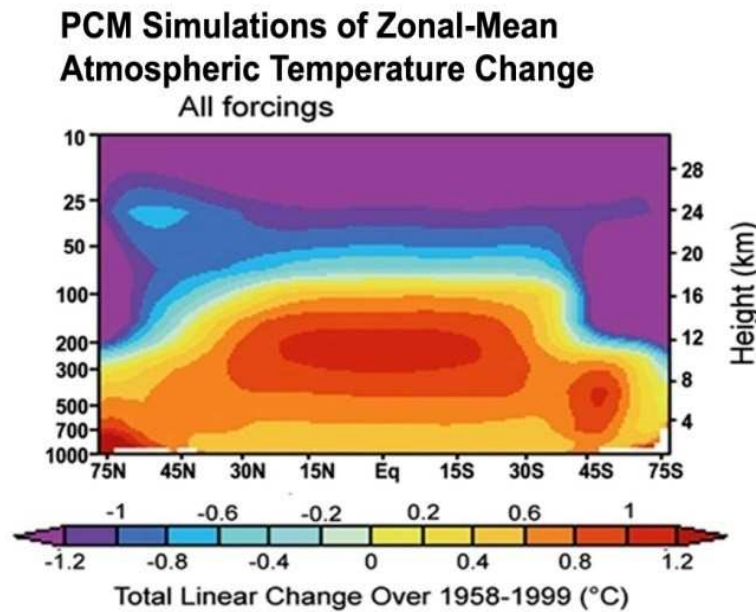


Figure 2. Greenhouse-model-predicted temperature trends versus latitude and altitude; this is figure 1.3F from CCSP 2006, p. 25. Note the increased temperature trends in the tropical mid-troposphere, in agreement also with the IPCC result (IPCC-AR4 2007, p. 675).

issued in January 2000 (NAS, 2000). That NAS report compared surface and troposphere temperature trends and concluded they cannot be reconciled. Six years later, the CCSP report expanded considerably on the NAS study. It is essentially a specialized report addressing the most crucial issue in the global warming debate: Is current global warming anthropogenic or natural? The CCSP result is unequivocal. While all greenhouse models show an increasing warming trend with altitude, peaking around 10 km at roughly two times the surface value, the temperature data from balloons give the opposite result: no increasing warming, but rather a slight cooling with altitude in the tropical zone. See Figures 2 and 3, taken directly from the CCSP report.

HadAT2 radiosonde data

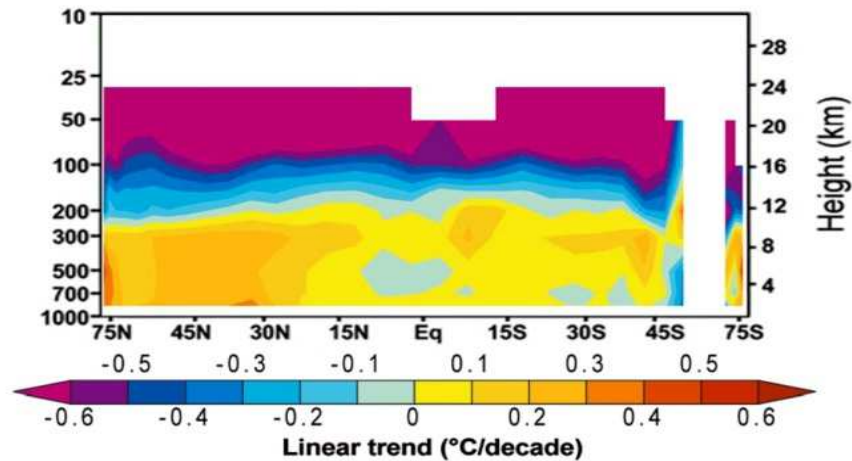


Figure 3. By contrast, observed temperature trends versus latitude and altitude; this is figure 5.7E from CCSP 2006, p. 116. These trends are based on the analysis of radiosonde data by the Hadley Centre and are in good agreement with the corresponding U.S. analyses. *Notice the absence of increased temperature trends in the tropical mid-troposphere.*

The CCSP executive summary inexplicably claims agreement between observed and calculated patterns, the opposite of what the report itself documents. It tries to dismiss the obvious disagreement shown in the body of the report by suggesting there might be something wrong with both balloon and satellite data. Unfortunately, many people do not read beyond the summary and have therefore been misled to believe the CCSP report supports anthropogenic warming. It does not.

The same information also can be expressed by plotting the difference between surface trend and troposphere trend for the models and for the data (Singer, 2001). As seen in Figure 4a and 4b below, the models show a histogram of negative values (i.e. surface trend less than troposphere trend) indicating that atmospheric warming will be greater than surface warming. By contrast, the data show mainly positive values for the difference in trends, demonstrating that measured warming is occurring principally on the surface and not in the atmosphere.

Modeled and Observed Temperature Trends in the Tropics (20°S - 20°N)

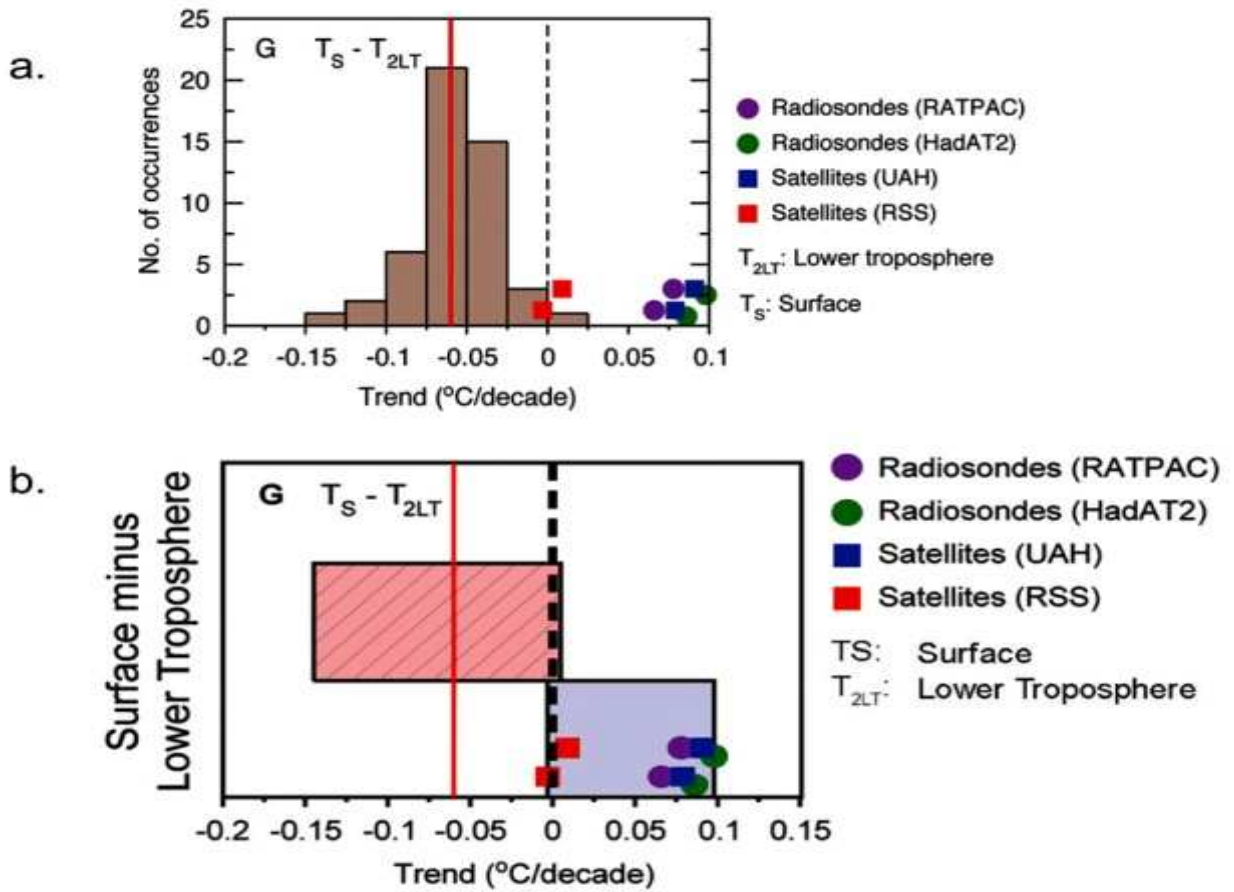


Figure 4a. Another way of presenting the difference between temperature trends of surface and lower troposphere; this is figure 5.4G from CCSP 2006, p. 111. The model results show a spread of values (histogram); the data points show balloon and satellite trend values. Note the model results hardly overlap with the actual observed trends. (The apparent deviation of the RSS analysis of the satellite data is as yet unexplained.)

Figure 4b. By contrast, the executive summary of the CCSP report presents the same information as Figure 4a in terms of 'range' and shows a slight overlap between modeled and observed temperature trends (Figure 4G, p. 13). **However, the use of 'range' is clearly inappropriate (Douglass et al. 2007) since it gives undue weight to 'outliers.'**

The same information can be expressed in yet a different way, as seen in research papers by Douglass *et al.* (2004, 2007), as shown in Figure 5 below. *The models show an increase in temperature trend with altitude but the observations show the opposite.*

Models and Observations Disagree [Douglass, Christy, Pearson, Singer 2007]

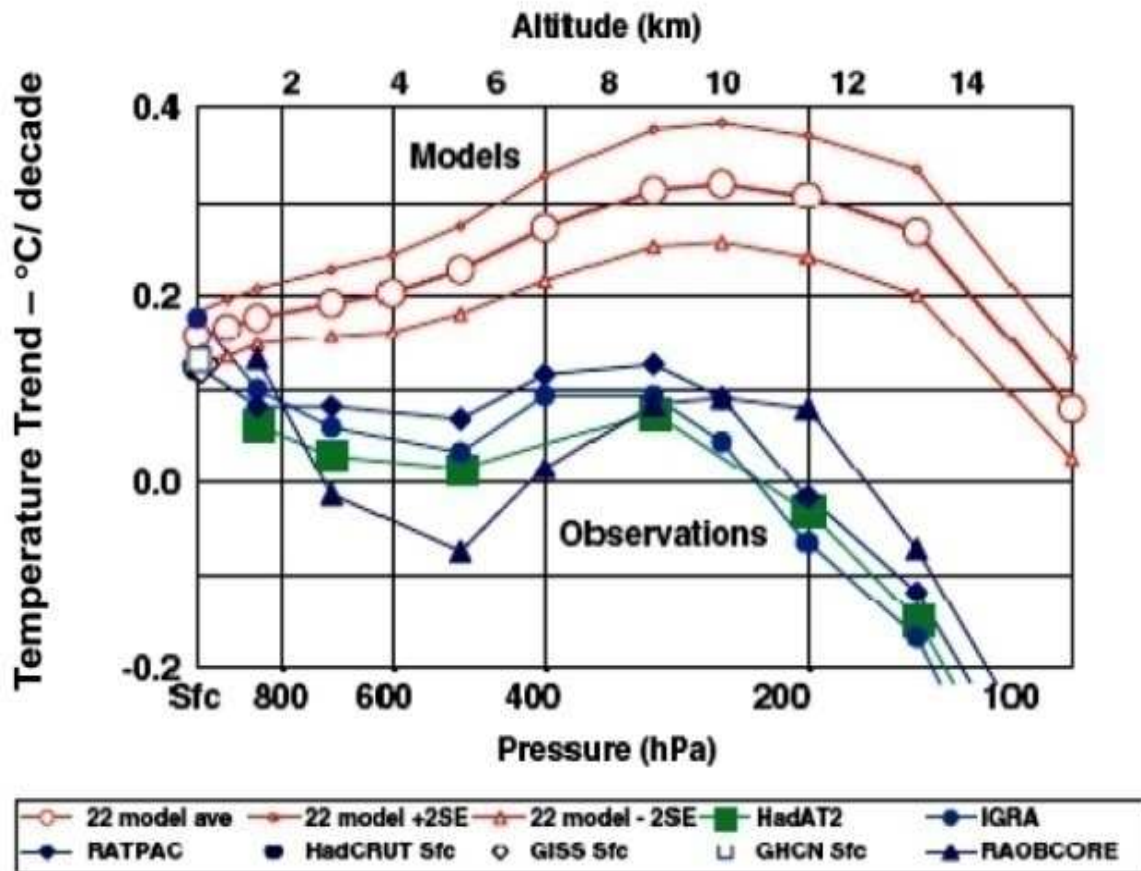


Figure 5. A more detailed view of the disparity of temperature trends is given in this plot of trends (in degrees C/decade) versus altitude in the tropics [Douglass et al. 2007]. **Models show an increase in the warming trend with altitude, but balloon and satellite observations do not.**

This mismatch of observed and calculated fingerprints clearly falsifies the hypothesis of anthropogenic global warming (AGW). We must conclude therefore that anthropogenic greenhouse gases can contribute only in a minor way to the current warming, which is mainly of natural origin. The IPCC seems to be aware of this contrary evidence but has tried to ignore it or wish it away. The summary for policymakers of IPCC's Fourth Assessment Report (IPCC 2007-I, p. 5) distorts the key result of the CCSP report: "New analyses of balloon-borne and satellite

measurements of lower- and mid-tropospheric temperature show warming rates that are similar to those of the surface temperature record, and are consistent within their respective uncertainties, largely reconciling a discrepancy noted in the TAR.” How is this possible? It is done partly by using the concept of “range” instead of the statistical distribution shown in Fig. 4a. But “range” is not a robust statistical measure because it gives undue weight to “outlier” results (Fig. 4b). If robust probability distributions were used they would show an exceedingly low probability of any overlap of modeled and the observed temperature trends.

Our fingerprint results have been challenged by Santer et al [2009] – even though the NIPCC conclusions are directly based on data taken from CCSP-SAP-1.1. Santer was the lead author of the crucial Chapter 5, which displayed and compared modeled and observed patterns of temperature trends. Santer et al [2009] now claim that there is consistency and no disparity. I have shown [Singer, to be submitted] that their claim is spurious and based on misuse of data and statistical analysis.

If one takes GH model results seriously, then the greenhouse fingerprint would suggest the true surface trend should be only 30 to 50 percent of the observed balloon/satellite trends in the troposphere. ***In that case, one would end up with a much-reduced surface warming trend, an insignificant AGW effect, and a minor GH-induced warming in the future.***

APP-F--References

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